

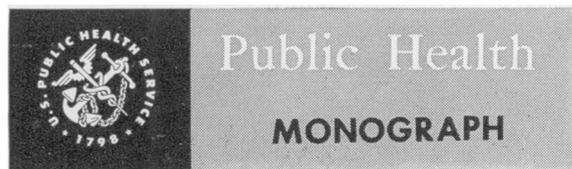
Experimental Approach to DDT Toxicity

Many human health problems have been created with the introduction of chlorinated hydrocarbons as pesticides. Much interest has centered around food residues, since one common method of application of these insecticides has been deliberately to use their residue effect for pest control. Owing to previous experience with other types of insecticides having a residue effect, there is an extensive precedent for food sampling, chemical analysis, legislation, and field regulations. However, to do this intelligently, the magnitude of the problem has to be carefully defined.

Specifically, in regard to chlorinated hydrocarbons there is no argument that these compounds are dangerous and lethal when ingested in large amounts. The only difference of opinion relates to the exact level at which a given food residue becomes sufficiently large so that its potential hazard to man outweighs its value for insect control. The development of insect resistance and tolerance is likely to make this type of decision increasingly difficult. DDT (2,2 bis-(p-chlorophenyl)-1,1,1-trichloroethane) is a typical example of a chlorinated hydrocarbon in extensive field use. This was the compound selected for experimentation.

In view of the importance of safeguarding human life, while permitting agriculture to use these chemicals as indicated, it would appear that there is a need for more basic information on the physiological effect of human exposure to low doses of these compounds. One approach is to simulate the human experience by continuously feeding various levels of DDT incorporated into the diet of white rats. This method, even though representing a laboratory simplification of field conditions, creates new difficulties in the evaluation of the significance of tissue changes or biochemical abnormalities.

Ultimately, the extrapolation of animal studies to human medicine represents the most vexing problem of all.



No. 43

The accompanying summary covers the principal findings presented in Public Health Monograph No. 43, published concurrently with this issue of Public Health Reports. The senior author is with the National Cancer Institute, Public Health Service, Bethesda, Md.; and the junior authors are with the Technical Development Laboratories, Communicable Disease Center, Public Health Service, Savannah, Ga.

Readers wishing the data in full may purchase copies of the monograph from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. A limited number of free copies are available to official agencies and others directly concerned on specific request to the Public Inquiries Branch of the Public Health Service. Copies will be found also in the libraries of professional schools and of the major universities and in selected public libraries.

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Ortega, Paul, Hayes, Wayland J., Jr., Durham, William F., and Mattson, Arnold: DDT in the diet of the rat. Public Health Monograph No. 43 (Public Health Service Publication No. 484). 27 pages. Illustrated. U. S. Government Printing Office, Washington, D. C., 1956. Price 30 cents.

Briefly, our experiments used 178 male and 104 female white rats fed levels of DDT from less than 0.05 parts per million of the poison in the diet as a whole up to 5,000 p.p.m. from periods of 2 weeks to 20 months. The animals were studied for clinical manifestations of toxicity, for gross and microscopic tissue changes, for rapidity of development and permanence of histopathology, and for recovery on a DDT-free diet after previous exposures. Special biochemical tests were used for body fat and tissue storage of DDT, as well as for liver function determinations. Certain laboratory devices

such as serial liver biopsy and study of different chemical isomers of this molecule added some supplementary information.

To summarize the results of the experiment, the salient feature among numerous other data was that cellular alterations could be demonstrated in the liver of rats fed DDT at levels as low as 5 p.p.m. in the diet. However, the findings indicated that stress should be placed on the mildness of these changes, their ready reversibility, and their imperfect correlation with liver function or with the clinical symptomatology of DDT.

technical publications

Infectious Hepatitis in New Delhi **Report of the Committee Investigating the Epidemic of Jaundice, December 1955–January 1956**

Public Health Service Reprint from the Hindustani Standard, February 18, 1956. 28 pages. Mimeographed.

The text of a report by the committee which investigated the recent outbreak of infectious hepatitis in New Delhi, India, has been reproduced and is available in limited quantities from the Water Supply and Water Pollution Program, Robert A. Taft Sanitary Engineering Center, Cincinnati 26, Ohio, Attention: Dr. R. L. Woodward.

The report documents the first waterborne infectious hepatitis outbreak associated with a water supply treated in a modern water treatment plant providing coagulation,

rapid sand filtration, and chlorination. Bacteriological tests for coliform bacteria showed no evidence of contamination.

The report holds that the authorities concerned had taken the necessary steps to guard against bacterial contamination of the water but not against viral infection.

Design for Statewide Nursing Surveys

Public Health Service Publication No. 460. 88 pages. 50 cents.

The latest techniques for finding the extent of nurse shortages and removing some of the causes are contained in a new manual prepared by the Division of Nursing Resources. Design for Statewide Nursing Surveys tells how to organize a survey committee, how to obtain community support for making surveys, and how

to gather and analyze information on local supply and nurse shortages.

A section on reappraisal of nursing needs and resources tells how to set up a plan for periodic fact finding after the basic survey has been made. Examples of progress in some 40 States which have made preliminary surveys, samples of the letters, forms, and tables used for compiling the facts, and suggested guides for evaluating adequacy of nurse supply are given.

This section carries announcements of all new Public Health Service publications and of selected new publications on health topics prepared by other Federal Government agencies.

Publications for which prices are quoted are for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Orders should be accompanied by cash, check, or money order and should fully identify the publication. Public Health Service publications which do not carry price quotations, as well as single sample copies of those for which prices are shown, can be obtained without charge from the Public Inquiries Branch, Public Health Service, Washington 25, D. C.

The Public Health Service does not supply publications issued by other agencies.
